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**TRANSMITTAL LETTER TO THE UNITED STATES
DESIGNATED/ELECTED OFFICE (DO/EO/US)
CONCERNING A FILING UNDER 35 U.S.C. 371**

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INTERNATIONAL APPLICATION NO.
PCT/EP00/00904

INTERNATIONAL FILING DATE
February 4, 2000

PRIORITY DATE CLAIMED
February 13, 1999

TITLE OF INVENTION

USE OF EMULSIONS AS IMPREGNATING AGENTS AND REVIVING AGENTS

APPLICANT(S) FOR DO/EO/US

Guido Baumöeller, Rolf Kawa and Achim Ansmann

Applicant herewith submits to the United States Designated/Elected Office (EO/DO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☐ This express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39 (1).
4. ☒ A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.
5. ☒ A copy of the International Application as filed (35 U.S.C. 371(c)(2)).
 - a. ☐ is transmitted herewith (required only if not transmitted by the International Bureau).
 - b. ☒ has been transmitted by the International Bureau.
 - c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. ☒ A translation of the International Application into English (35 U.S.C. 371(c)(2)).
7. ☒ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))
 - a. ☐ are transmitted herewith (required only if not transmitted by the International Bureau).
 - b. ☐ have been transmitted by the International Bureau.
 - c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
 - d. ☒ have not been made and will not be made.
8. ☐ A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
9. ☒ An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)). (UNEXECUTED)
10. ☐ A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

Items 11. to 16. below concern other document(s) or information included:

11. ☐ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
12. ☐ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13. ☒ A FIRST preliminary amendment
☐ A SECOND or SUBSEQUENT preliminary amendment.
14. ☐ A substitute specification.
15. ☐ A change of power of attorney and/or address letter.
16. ☐ Other items or information.:

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : Baumoeller et al.
I.A. Number : PCT/EP00/00904
I.A. Filing Date: February 4, 2000
Priority Date : February 13, 1999
Title : USE OF EMULSIONS AS IMPREGNATING
AGENTS AND REVIVING AGENTS

Grp./A.U. : Unknown
Examiner : Unknown

Docket No. : H 3954 PCT/US

Assistant Commissioner for Patents
Box PCT
Washington, DC 20231

ATTN: DO/EO/US

PRELIMINARY AMENDMENT

Sir:

Preliminary to examination, please amend the instant application as follows.

In the Specification:

At page 1, line 1, delete "Field of the Invention", and insert
--Background of the Invention--.

At page 1, line 6, delete "Prior Art".

Enter a new page 29, submitted herewith, containing the Abstract of the
Disclosure.

In the Claims:

Cancel claims 1-9, without prejudice.
Please enter the following new claims.

10. (new) A process for making paper substrates having a soft feel comprising:
 - (a) providing a paper substrate;
 - (b) providing an emulsion containing:

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(i) a polyol poly-12-hydroxystearate;

(ii) a wax ester; and

(iii) a wax; and

(c) impregnating the paper substrate with the emulsion.

11. (new) The process of claim 10 wherein the polyol poly-12-hydroxystearate is polyglycerol poly-12-hydroxystearate.

12. (new) The process of claim 10 wherein the polyol poly-12-hydroxystearate is present in the emulsion in an amount of from about 5 to 25% by weight, based on the weight of the emulsion.

13. (new) The process of claim 12 wherein the wax ester corresponds to formula (I):



wherein R^1CO is a linear or branched acyl group having from 6 to 22 carbon atoms and up to 3 double bonds, and R^2 is a linear or branched alkyl and/or alkenyl group having from 6 to 22 carbon atoms, and wherein the total number of carbon atoms present in the ester is at least 20.

14. (new) The process of claim 10 wherein the wax ester is present in the emulsion in an amount of from about 50 to 90% by weight, based on the weight of the emulsion.

15. (new) The process of claim 10 wherein the wax is present in the composition in an amount of from about 5 to 25% by weight, based on the weight of the emulsion.

16. (new) The process of claim 10 wherein the paper substrate is based on up to about 95% by weight recycled paper pulp.

17. (new) The product of the process of claim 10.

18. (new) The product of the process of claim 11.

19. (new) The product of the process of claim 12.

20. (new) The product of the process of claim 13.

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21. (new) The product of the process of claim 14.
22. (new) The product of the process of claim 15.
23. (new) The product of the process of claim 16.

REMARKS/ARGUMENTS

Claims 10-23 are currently pending in the instant application.

The Specification has been amended to include the preferred section headings pursuant to 37 C.F.R. §1.77. An Abstract of the Disclosure in accordance with the abstract of the corresponding international publication has been added on a separate sheet following the claims. All of the amendments to the Specification constitute deletions of original section headings and/or paragraphs, and insertions or additions of new section headings and/or paragraphs. It is submitted that the amendments to the Specification made herein introduce no new matter. Their entry is therefore proper and respectfully requested. Accordingly, pursuant to 37 C.F.R. §1.121(b)(1)(iii), no separate page captioned "VERSION WITH MARKINGS TO SHOW CHANGES MADE" is necessary.

Original claims 1-9 have been canceled and replaced with new claims 10-23 solely for the purpose of improving clarity and grammar, which may suffer in translation, and not for any reason which relates to the statutory requirements for a patent. New claims 10-23 have not been added in response to any rejection, nor in anticipation of any rejection. Applicant(s) respectfully submit(s) that the scope of new claims 10-23 corresponds to the scope of original claims 1-9~~x~~, and that new claims 10-23 are no narrower than original claims 1-9. Furthermore, although a moot point in view of their cancellation, Applicant(s) respectfully submit(s) that original claims 1-9 satisfied the requirements of 35 U.S.C. §112, as filed. New claims 10-23 are supported by the claims as originally filed and by the Examples. No new matter has been introduced. Entry is therefore proper and respectfully requested.

Prompt examination of the instant application in view of the amendments

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made herein is respectfully requested.

Respectfully submitted,



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Attached:

1. Added Page 29

Abstract of the Disclosure

A process for making paper substrates having a soft feel involving: (a) providing a paper substrate; (b) providing an emulsion containing: (i) a polyol poly-12-hydroxystearate; (ii) a wax ester; and (iii) a wax; and (c) impregnating the paper substrate with the emulsion.

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Use of Emulsions as Impregnating Agents and Reviving Agents

Field of the Invention

This invention relates generally to utility and hygienic paper towels and, more specifically, to the use of special emulsions as impregnating and softening compositions.

5

Prior Art

10 The generic term "paper" encompasses about 3000 different types and articles which can differ, sometimes considerably, in their applications and their properties. Their production involves the use of numerous additives among the most important of which are fillers (for example chalk or kaolin) and binders (for example starch). For tissues and hygienic papers, which come into relatively close contact with the human skin, there is a particular need for an agreeable soft feel which is normally given to the paper by careful selection of the fibers and, in particular, by a high percentage of fresh
15 mechanical wood pulp or cellulose. However, in the interests of economic paper manufacture and from the ecological viewpoint, it is desirable to use large amounts of inferior-quality deinked wastepaper. Unfortunately, this means that the softness of the paper is significantly reduced which is troublesome in practice and can even lead to irritation of the skin, particularly
20 with frequent use.

Accordingly, there has been no shortage of attempts in the past to treat tissue papers by impregnation, coating or other surface treatments in such a way that a more agreeable soft feel is achieved. International patent application **WO 95/35411** (Procter & Gamble) relates to tissue papers coated

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with softening compositions which contain 20 to 80% by weight of a water-free emulsifier (mineral oils, fatty acid esters, fatty alcohol ethoxylates, fatty acid ethoxylates, fatty alcohols and mixtures thereof), 5 to 95% by weight of a carrier (fatty alcohols, fatty acids or fatty alcohol ethoxylates containing 12 to 22 carbon atoms in the fatty group) and 1 to 50% by weight of surfactants with an HLB value of preferably 4 to 20. The Examples mentioned in this document all contain petrolatum as emulsifier. International patent application **WO 95/35412** discloses similar tissue papers where water-free mixtures of (a) mineral oils, (b) fatty alcohols or fatty acids and (c) fatty alcohol ethoxylates are used as softeners. International patent application **WO 95/16824** (Procter & Gamble) describes softening compositions for tissue papers containing mineral oil, fatty alcohol ethoxylates and nonionic surfactants (sorbitan esters, glucamides). In addition, International patent application **WO 97/30216** (Kaysersberg) describes softening compositions for paper handkerchiefs which contain (a) 35 to 90% by weight of long-chain fatty alcohols, (b) 1 to 50% by weight of wax esters containing 24 to 48 carbon atoms, (c) 0 to 20% by weight of nonionic emulsifiers and (d) 0 to 50% by weight of mineral oil. From the applicational standpoint, however, the softness and feel of the treated papers are still in need of improvement.

Accordingly, the problem addressed by the present invention was to provide compositions with which dry utility papers, more particularly tissue papers, and tissue cloths having a particularly agreeable soft feel and excellent skin-care properties could even be produced using raw materials comprising a high percentage of recycled paper. At the same time, only readily biodegradable auxiliaries would be used and the compositions would penetrate easily into the tissue, would be uniformly dispersed therein and, even in highly concentrated form, would have such a low viscosity that they would be easy to process.

Description of the Invention

The present invention relates to the use of emulsions containing

- 5 a) polyol poly-12-hydroxystearates,
- b) wax esters and
- c) waxes

as impregnating and softening compositions for papers, nonwovens and
10 cloths, preferably for treating the skin.

It has surprisingly been found that compositions of the type mentioned
above are capable of imparting an agreeable soft feel, even to particularly
critical tissue paper comprising up to 95% by weight recycled paper and
tissue cloth. The emulsions have low viscosities, even in highly concentrated
15 form, so that they are easy to process. By virtue of their small droplet size,
the emulsions penetrate very quickly into the tissues and are uniformly
dispersed therein. Another advantage is that the substantially odorless
compositions are ecotoxicologically safe and, in particular, are readily
biodegradable.

20

Polyol poly-12-hydroxystearates

The polyol poly-12-hydroxystearates which form component (a) are
known substances which are marketed by Henkel KGaA of Düsseldorf, FRG,
for example under the names of "Dehymuls® PGPH" and "Eumulgin® VL 75"
25 (mixture with Coco Glucosides in a ratio by weight of 1:1). Reference is also
made in this connection to International patent application **WO 95/34528**
(Henkel). The polyol component of the emulsifiers may be derived from
substances which contain at least 2, preferably 3 to 12 and more preferably

3 to 8 hydroxyl groups and 2 to 12 carbon atoms. Typical examples are

- (a) glycerol and polyglycerol;
- (b) alkylene glycols such as, for example, ethylene glycol, diethylene glycol, propylene glycol;
- (c) methylol compounds such as, in particular, trimethylol ethane, trimethylol propane, trimethylol butane, pentaerythritol and dipentaerythritol;
- (d) alkyl oligoglucosides containing 1 to 22, preferably 1 to 8 and more preferably 1 to 4 carbon atoms in the alkyl group such as, for example, methyl and butyl glucoside;
- (e) sugar alcohols containing 5 to 12 carbon atoms such as, for example, sorbitol or mannitol,
- (f) sugars containing 5 to 12 carbon atoms such as, for example, glucose or sucrose;
- (g) amino sugars such as, for example, glucamine.

Among the emulsifiers suitable for use in accordance with the invention, reaction products based on polyglycerol are particularly important by virtue of their excellent applicational properties. It has proved to be of particular advantage to use selected polyglycerols which have the following homolog distribution (the preferred ranges are shown in brackets):

glycerol	: 5 to 35 (15 to 30) % by weight
diglycerols	: 15 to 40 (20 to 32) % by weight
triglycerols	: 10 to 35 (15 to 25) % by weight
tetraglycerols	: 5 to 20 (8 to 15) % by weight
pentaglycerols	: 2 to 10 (3 to 8) % by weight

oligoglycerols : to 100 % by weight

Wax esters

Wax esters used as component (b) are generally understood to be
 5 substances which correspond to formula (I):



(I)

in which R^1CO is a linear or branched acyl group containing 6 to 22 carbon
 10 atoms and 0 and/or 1 to 3 double bonds and R^2 is a linear or branched alkyl
 and/or alkenyl group containing 6 to 22 carbon atoms, with the proviso that
 the number of carbon atoms in the ester is at least 20. Typical examples of
 such substances are myristyl myristate, myristyl palmitate, myristyl stearate,
 myristyl isostearate, myristyl oleate, myristyl behenate, myristyl erucate, cetyl
 15 myristate, cetyl palmitate, cetyl stearate, cetyl isostearate, cetyl oleate, cetyl
 behenate, cetyl erucate, stearyl myristate, stearyl palmitate, stearyl stearate,
 stearyl isostearate, stearyl oleate, stearyl behenate, stearyl erucate, isostearyl
 myristate, isostearyl palmitate, isostearyl stearate, isostearyl isostearate,
 isostearyl oleate, isostearyl behenate, isostearyl oleate, oleyl myristate, oleyl
 20 palmitate, oleyl stearate, oleyl isostearate, oleyl oleate, oleyl behenate, oleyl
 erucate, behenyl myristate, behenyl palmitate, behenyl stearate, behenyl
 isostearate, behenyl oleate, behenyl behenate, behenyl erucate, erucyl
 myristate, erucyl palmitate, erucyl stearate, erucyl isostearate, erucyl oleate,
 erucyl behenate and erucyl erucate. Unsaturated wax esters, for example
 25 oleyl oleate and oleyl erucate, are preferably used.

Waxes

Waxes which are used as component (c) are natural or synthetic

substances which are kneadable at 20°C, solid to fragile and hard, coarsely to finely crystalline, transparent to opaque, but not glass-like, melt without decomposing above 40°C and are of comparatively low viscosity and non-stringing even just above their melting point. The waxes suitable for use

5 in accordance with the invention differ from resins, for example, in the fact that they change into a molten low-viscosity state at temperatures of generally about 50 to 90°C, in exceptional cases even as high as 200°C, and are substantially free from ash-forming compounds. The waxes are divided into the following three groups according to their origin: **natural waxes** such as,

10 for example, candelilla wax, carnauba wax, Japan wax, espartogross wax, cork wax, guaruma wax, rice oil wax, sugar cane wax, ouricury wax, montan wax, beeswax, shellac wax, spermaceti, lanolin (wool wax), uropygial fat, ceresine, ozocerite (earth wax), petrolatum, paraffin waxes and microwaxes; **chemically modified waxes** (hard waxes) such as, for example, montan

15 ester waxes, sasol waxes, hydrogenated jojoba waxes and **synthetic waxes** such as, for example, polyalkylene waxes and polyethylene glycol waxes. In this connection, natural waxes, especially vegetable waxes, are preferred.

Tissue papers and tissue cloths

20 Tissue papers to which the present invention relates may have a single-ply or multiple-ply structure. In general, the papers have a weight per square meter of 10 to 65 and preferably 15 to 30 g and a density of 0.6 g/cm³ or lower. Examples of tissue papers to which the use according to the invention is applicable are toilet papers, paper handkerchiefs, facial wipes,

25 make-up removing wipes, freshening wipes, kitchen roll and the like. Depending on the particular application, the tissues may contain special active ingredients, for example moisturizers, insect repellents (after-sun wipes), dihydroxyacetone, deodorizers, surfactants, alcohols (freshening

wipes), skin-care oils, anti-inflammatory agents (baby wipes) and the like. Apart from paper-based tissues, the use according to the invention is also applicable to corresponding tissue cloths made of fibers or fleeces.

5 Emulsions

In one preferred embodiment of the invention, the emulsions contain - again based on active substance content -

- 10 (a) 5 to 25, preferably 8 to 20 and more preferably 10 to 15% by weight of polyol poly-12-hydroxystearates,
- (b) 50 to 90, preferably 60 to 85 and more preferably 70 to 80% by weight of wax esters and
- (c) 5 to 25, preferably 8 to 20 and more preferably 10 to 15% by weight of waxes,

15 with the proviso that the quantities shown add up to 100% by weight. The active substance content of the emulsions may be between 0.5 and 80% by weight according to the particular application envisaged. With relatively high active substance contents, the emulsions undergo a dramatic reduction in
20 flowability; with relatively low active substance contents, they do not develop their intended effect. Concentrates with an active substance content of 10 to 70% by weight which are designed for dilution to an in-use concentration of 1 to 15% by weight are preferably marketed. If desired, the aqueous phase may also contain polyols, preferably up to 15% by weight of glycerol.

25

Skin-care oils

In another preferred embodiment of the invention, skin-care oils are used as auxiliaries and additives. Suitable skin-care oils are, for example,

Guerbet alcohols based on fatty alcohols containing 6 to 18 and preferably 8 to 10 carbon atoms, esters of hydroxycarboxylic acids with linear or branched C_{6-22} fatty alcohols, more particularly dioctyl malate, esters of linear and/or branched fatty acids with polyhydric alcohols (for example propylene glycol, dimer diol or trimer triol) and/or Guerbet alcohols, triglycerides based on C_{6-10} fatty acids, liquid mono-/ di-/triglyceride mixtures based on C_{6-18} fatty acids, esters of C_{6-22} fatty alcohols and/or Guerbet alcohols with aromatic carboxylic acids, more particularly benzoic acid, esters of C_{2-12} dicarboxylic acids with linear or branched alcohols containing 1 to 22 carbon atoms or polyols containing 2 to 10 carbon atoms and 2 to 6 hydroxyl groups, vegetable oils, branched primary alcohols, substituted cyclohexanes, linear and branched C_{6-22} fatty alcohol carbonates, Guerbet carbonates, esters of benzoic acid with linear and/or branched C_{6-22} alcohols (for example Finsolv® TN), linear or branched, symmetrical or nonsymmetrical dialkyl ethers containing 6 to 22 carbon atoms per alkyl group, ring opening products of epoxidized fatty acid esters with polyols, silicone oils and/or aliphatic or naphthenic hydrocarbons such as, for example, squalane, squalene and dialkylcyclohexanes.

Co-emulsifiers

If desired, the compositions to be used in accordance with the invention may contain other emulsifiers, preferably nonionic, cationic or amphoteric emulsifiers, such as:

- (1) $C_{12/18}$ fatty acid monoesters and diesters of adducts of 1 to 30 moles of ethylene oxide with glycerol;
- (2) glycerol mono/diesters, sorbitan mono/diesters and sugar mono/diesters of saturated and unsaturated fatty acids containing 6 to 22 carbon atoms or hydroxycarboxylic acids containing 2 to 6 carbon

atoms, for example citric acid, malic acid or tartaric acid, and ethylene oxide adducts thereof;

- (3) alkyl mono- and oligoglycosides containing 8 to 22 carbon atoms in the alkyl group and ethoxylated analogs thereof;
- 5 (4) adducts of 15 to 60 moles of ethylene oxide with castor oil and/or hydrogenated castor oil;
- (5) polyglycerol esters such as, for example, polyglycerol polyricinoleate or polyglycerol dimerate. Mixtures of compounds from several of these classes are also suitable;
- 10 (6) adducts of 2 to 15 moles of ethylene oxide with castor oil and/or hydrogenated castor oil;
- (7) partial esters based on linear, branched, unsaturated or saturated C_{6/22} fatty acids, ricinoleic acid and 12-hydroxystearic acid and glycerol, polyglycerol, pentaerythritol, dipentaerythritol, sugar alcohols (for
15 example sorbitol), alkyl glucosides (for example methyl glucoside, butyl glucoside, lauryl glucoside) and polyglucosides (for example cellulose);
- (8) mono-, di and trialkyl phosphates and mono-, di- and/or tri-PEG-alkyl phosphates and salts thereof;
- (9) wool wax alcohols;
- 20 (10) polysiloxane/polyalkyl polyether copolymers and corresponding derivatives;
- (11) mixed esters of pentaerythritol, fatty acids, citric acid and fatty alcohol according to **DE-PS 11 65 574** and/or mixed esters of fatty acids containing 6 to 22 carbon atoms, methyl glucose and polyols,
25 preferably glycerol or polyglycerol,
- (12) polyalkylene glycols and
- (13) glycerol carbonate.

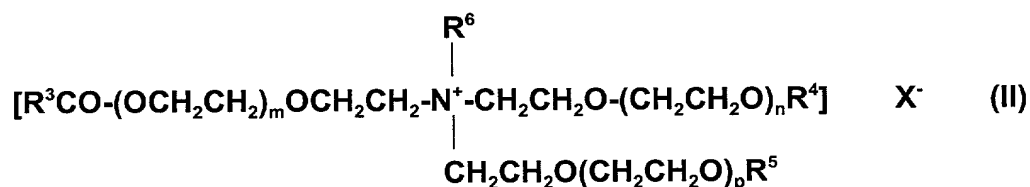
The addition products of ethylene oxide and/or propylene oxide with glycerol monoesters and diesters and sorbitan monoesters and diesters of fatty acids or with castor oil are known commercially available products. They are homolog mixtures of which the average degree of alkoxylation corresponds to the ratio between the quantities of ethylene oxide and/or propylene oxide and substrate with which the addition reaction is carried out. $C_{12/18}$ fatty acid monoesters and diesters of adducts of ethylene oxide with glycerol are known as refatting agents for cosmetic compositions from **DE-PS 20 24 051**.

$C_{8/18}$ alkyl mono- and oligoglycosides, their production and their use as surfactants are known from the prior-art literature. They are produced in particular by reacting glucose or oligosaccharides with primary alcohols containing 8 to 18 carbon atoms. So far as the glycoside component is concerned, both monoglycosides where a cyclic sugar unit is attached to the fatty alcohol by a glycoside bond and oligomeric glycosides with a degree of oligomerization of preferably up to about 8 are suitable. The degree of oligomerization is a statistical mean value on which a homolog distribution typical of such technical products is based.

Other suitable emulsifiers are zwitterionic surfactants. Zwitterionic surfactants are surface-active compounds which contain at least one quaternary ammonium group and at least one carboxylate and one sulfonate group in the molecule. Particularly suitable zwitterionic surfactants are the so-called betaines, such as the N-alkyl-N,N-dimethyl ammonium glycinate, for example cocoalkyl dimethyl ammonium glycinate, N-acylaminopropyl-N,N-dimethyl ammonium glycinate, for example cocoacylaminopropyl dimethyl ammonium glycinate, and 2-alkyl-3-carboxymethyl-3-hydroxyethyl imidazolines containing 8 to 18 carbon atoms in the alkyl or acyl group and cocoacylaminoethyl hydroxyethyl carboxymethyl glycinate. The fatty acid amide

derivative known under the CTFA name of *Cocamidopropyl Betaine* is particularly preferred. Ampholytic surfactants are also suitable emulsifiers. Ampholytic surfactants are surface-active compounds which, in addition to a $C_{8/18}$ alkyl or acyl group, contain at least one free amino group and at least one -COOH- or -SO₃H- group in the molecule and which are capable of forming inner salts. Examples of suitable ampholytic surfactants are N-alkyl glycines, N-alkyl propionic acids, N-alkylaminobutyric acids, N-alkyliminodipropionic acids, N-hydroxyethyl-N-alkylamidopropyl glycines, N-alkyl taurines, N-alkyl sarcosines, 2-alkylaminopropionic acids and alkylaminoacetic acids containing around 8 to 18 carbon atoms in the alkyl group. Particularly preferred ampholytic surfactants are N-cocoalkylaminopropionate, cocoacylaminoethyl aminopropionate and $C_{12/18}$ acyl sarcosine. According to the invention, other suitable emulsifiers besides ampholytic surfactants are quaternary emulsifiers, those of the esterquat type, preferably methyl-quaternized difatty acid triethanolamine ester salts, being particularly preferred because they further improve softness. "Esterquats" are generally understood to be quaternized fatty acid triethanolamine ester salts. These are known substances which may be obtained by the relevant methods of preparative organic chemistry., cf. International patent application **WO 91/01295** (Henkel). According to this document, triethanolamine is partly esterified with fatty acids in the presence of hypophosphorous acid, air is passed through and the reaction product is quaternized with dimethyl sulfate or ethylene oxide. In addition, German patent **DE-C1 4308794** (Henkel) describes a process for the production of solid esterquats in which the quaternization of triethanolamine esters is carried out in the presence of suitable dispersants, preferably fatty alcohols. Overviews on this subject have been published, for example, by R. Puchta et al. in **Tens. Surf. Det.**, 30, 186 (1993), by M. Brock in **Tens. Surf. Det.** 30, 394 (1993), by R. Lagerman et al.

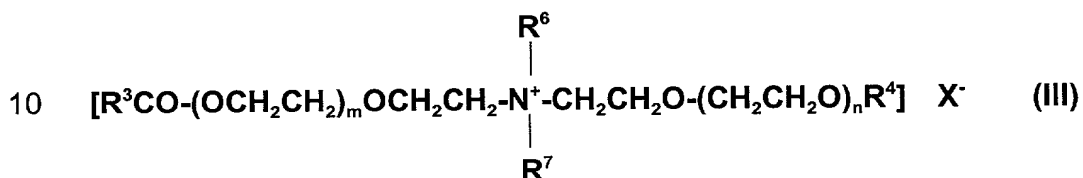
in *J. Am. Oil. Chem. Soc.*, **71**, 97 (1994) and by I. Shapiro in *Cosm. Toil.*, **109**, 77 (1994). The quaternized fatty acid triethanolamine ester salts correspond to formula (II):



in which R^3CO is an acyl group containing 6 to 22 carbon atoms, R^4 and R^5 independently of one another represent hydrogen or have the same meaning as R^3CO , R^6 is an alkyl group containing 1 to 4 carbon atoms or a $(\text{CH}_2\text{CH}_2\text{O})_q\text{H}$ group, m , n and p together stand for 0 or numbers of 1 to 12, q is a number of 1 to 12 and X is halide, alkyl sulfate or alkyl phosphate. Typical examples of esterquats which may be used in accordance with the invention are products based on caproic acid, caprylic acid, capric acid, lauric acid, myristic acid, palmitic acid, isostearic acid, stearic acid, oleic acid, elaidic acid, arachic acid, behenic acid and erucic acid and the technical mixtures thereof obtained for example in the pressure hydrolysis of natural fats and oils. Technical $\text{C}_{12/18}$ cocofatty acids and, in particular, partly hydrogenated $\text{C}_{16/18}$ tallow or palm oil fatty acids and high-elaidic $\text{C}_{16/18}$ fatty acid cuts are preferably used. To produce the quaternized esters, the fatty acids and the triethanolamine may be used in a molar ratio of 1.1:1 to 3:1. With the performance properties of the esterquats in mind, a ratio of 1.2:1 to 2.2:1 and preferably 1.5:1 to 1.9:1 has proved to be particularly advantageous. The preferred esterquats are technical mixtures of mono-, di- and triesters with an average degree of esterification of 1.5 to 1.9 and are derived from technical $\text{C}_{16/18}$ tallow or palm oil fatty acid (iodine value 0 to 40). In performance terms, quaternized fatty acid triethanolamine ester salts corresponding to formula (II),

in which R^3CO is an acyl group containing 16 to 18 carbon atoms, R^4 has the same meaning as R^3CO , R^5 is hydrogen, R^6 is a methyl group, m, n and p stand for 0 and X stands for methyl sulfate, have proved to be particularly advantageous. Other suitable esterquats besides the quaternized fatty acid

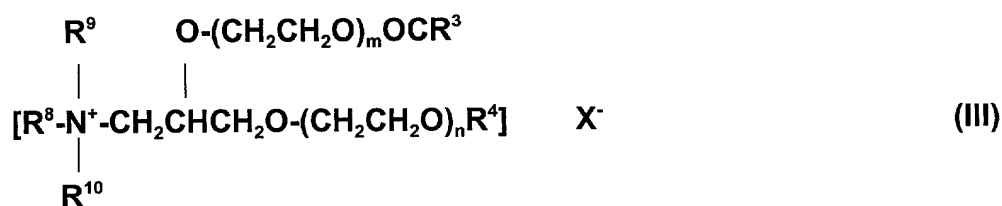
5 triethanolamine ester salts are quaternized ester salts of fatty acids with diethanolalkylamines corresponding to formula (III):



in which R^3CO is an acyl group containing 6 to 22 carbon atoms, R^4 is

15 hydrogen or has the same meaning as R^3CO , R^6 and R^7 independently of one another are alkyl groups containing 1 to 4 carbon atoms, m and n together stand for 0 or numbers of 1 to 12 and X stands for halide, alkyl sulfate or alkyl phosphate. Finally, another group of suitable esterquats are the quaternized ester salts of fatty acids with 1,2-dihydroxypropyl dialkylamines corresponding

20 to formula (IV):



in which R^3CO is an acyl group containing 6 to 22 carbon atoms, R^4 is hydrogen or has the same meaning as R^3CO , R^8 , R^9 and R^{10} independently of one another are alkyl groups containing 1 to 4 carbon atoms, m and n together stand for 0 or numbers of 1 to 12 and X stands for halide, alkyl sulfate or alkyl phosphate. So far as the choice of the preferred fatty acids and the optimum degree of esterification is concerned, the examples mentioned in regard to (II) also apply to the esterquats of formulae (III) and (IV).

Active substances

In one particular embodiment of the invention, the emulsions contain active substances such as, for example, mild surfactants, superfatting agents, consistency factors, thickeners, polymers, silicone compounds, fats, waxes, stabilizers, biogenic agents, deodorizers, film formers, UV protection factors, antioxidants, hydrotropes, preservatives, insect repellents, self-tanning agents, solubilizers, perfume oils, dyes, germ inhibitors and the like.

Typical examples of suitable mild, i.e. dermatologically compatible, **surfactants**, are fatty alcohol polyglycol ether sulfates, monoglyceride sulfates, mono- and/or dialkylsulfosuccinates, fatty acid isethionates, fatty acid sarcosinates, fatty acid taurides, fatty acid glutamates, α -olefin sulfonates, ether carboxylic acids, alkyl oligoglucosides, fatty acid glucamides, alkyl amidobetaines and/or protein fatty acid condensates (preferably based on wheat proteins).

Superfatting agents may be selected from such substances as, for

example, lanolin and lecithin and also polyethoxylated or acylated lanolin and lecithin derivatives, polyol fatty acid esters, monoglycerides and fatty acid alkanolamides, the fatty acid alkanolamides also serving as foam stabilizers.

The **consistency factors** mainly used are fatty alcohols or
5 hydroxyfatty alcohols containing 12 to 22 and preferably 16 to 18 carbon atoms and also partial glycerides, fatty acids or hydroxyfatty acids. A combination of these substances with alkyl oligoglucosides and/or fatty acid N-methyl glucamides of the same chain length and/or polyglycerol poly-12-hydroxystearates is preferably used. Suitable **thickeners** are, for example,
10 Aerosil types (hydrophilic silicas), polysaccharides, more especially xanthan gum, guar-guar, agar-agar, alginates and tyloses, carboxymethyl cellulose and hydroxyethyl cellulose, also relatively high molecular weight polyethylene glycol monoesters and diesters of fatty acids, polyacrylates (for example Carbopols® [Goodrich] or Synthalens® [Sigma]), polyacrylamides, polyvinyl
15 alcohol and polyvinyl pyrrolidone, surfactants such as, for example, ethoxylated fatty acid glycerides, esters of fatty acids with polyols, for example pentaerythritol or trimethylol propane, narrow-range fatty alcohol ethoxylates or alkyl oligoglucosides and electrolytes, such as sodium chloride and ammonium chloride.

20 Suitable **cationic polymers** are, for example, cationic cellulose derivatives such as, for example, the quaternized hydroxyethyl cellulose obtainable from Amerchol under the name of Polymer JR 400®, cationic starch, copolymers of diallyl ammonium salts and acrylamides, quaternized vinyl pyrrolidone/vinyl imidazole polymers such as, for example, Luviquat®
25 (BASF), condensation products of polyglycols and amines, quaternized collagen polypeptides such as, for example, Lauryldimonium Hydroxypropyl Hydrolyzed Collagen (Lamequat® L/Grünau), quaternized wheat polypeptides, polyethyleneimine, cationic silicone polymers such as, for

example, Amodimethicone, copolymers of adipic acid and dimethylaminohydroxypropyl diethylenetriamine (Cartaretine®/Sandoz), copolymers of acrylic acid with dimethyl diallyl ammonium chloride (Merquat® 550/Chemviron), polyaminopolyamides as described, for example, in **FR-A 2 252 840** and
5 crosslinked water-soluble polymers thereof, cationic chitin derivatives such as, for example, quaternized chitosan, optionally in microcrystalline distribution, condensation products of dihaloalkylene, for example dibromobutane, with bis-dialkylamines, for example bis-dimethylamino-1,3-propane, cationic guar gum such as, for example, Jaguar® CBS, Jaguar®C-17, Jaguar® C-16 of
10 Celanese, quaternized ammonium salt polymers such as, for example, Mirapol®A-15, Mirapol® AD-1, Mirapol® AZ-1 of Miranol.

Suitable **anionic, zwitterionic, amphoteric and nonionic polymers** are, for example, vinyl acetate/crotonic acid copolymers, vinyl pyrrolidone/vinyl acrylate copolymers, vinyl acetate/butyl maleate/isobornyl
15 acrylate copolymers, methyl vinyl ether/maleic anhydride copolymers and esters thereof, uncrosslinked and polyol-crosslinked polyacrylic acids, acrylamidopropyl trimethylammonium chloride/acrylate copolymers, octylacrylamide/methyl methacrylate/tert.-butylaminoethyl methacrylate/2-hydroxypropyl methacrylate copolymers, polyvinyl pyrrolidone, vinyl pyrrol-
20 idone/vinyl acetate copolymers, vinyl pyrrolidone/dimethylaminoethyl methacrylate/vinyl caprolactam terpolymers and optionally derivatized cellulose ethers and silicones.

Suitable **silicone compounds** are, for example, dimethyl polysiloxanes, methylphenyl polysiloxanes, cyclic silicones and amino-, fatty acid-,
25 alcohol-, polyether-, epoxy-, fluorine-, glycoside- and/or alkyl-modified silicone compounds which may be both liquid and resin-like at room temperature. Other suitable silicone compounds are simethicones which are mixtures of dimethicones with an average chain length of 200 to 300 dimethylsiloxane

units and hydrogenated silicates. In addition, a detailed overview of suitable volatile silicones was published by Todd et al. in **Cosm. Toil.** 91, 27 (1976).

Metal salts of fatty acids such as, for example, magnesium, aluminium and/or zinc stearate or ricinoleate may be used as **stabilizers**.

- 5 In the context of the invention, **biogenic agents** are, for example, tocopherol, tocopherol acetate, tocopherol palmitate, ascorbic acid, deoxyribonucleic acid, retinol, bisabolol, allantoin, phytantriol, panthenol, AHA acids, amino acids, ceramides, pseudoceramides, essential oils, plant extracts and vitamin complexes.
- 10 Suitable **deodorizers** are, for example, antiperspirants, such as aluminium chlorhydrates. These antiperspirants are colorless hygroscopic crystals which readily deliquesce in air and which accumulate when aqueous aluminium chloride solutions are concentrated by evaporation. Aluminium chlorhydrate is used for the production of perspiration-inhibiting and
- 15 deodorizing compositions and probably acts by partially blocking the sweat glands through the precipitation of proteins and/or polysaccharides [cf. **J. Soc. Cosm. Chem.** 24, 281 (1973)]. For example, an aluminium chlorhydrate which corresponds to the formula $[Al_2(OH)_5Cl] \cdot 2.5H_2O$ and which is particularly preferred for the purposes of the invention is commercially
- 20 available under the name of Locron® from Hoechst AG of Frankfurt, FRG [cf. **J. Pharm. Pharmacol.** 26, 531 (1975)]. Besides the chlorhydrates, aluminium hydroxylactates and acidic aluminium/zirconium salts may also be used.
- 25 Other suitable deodorizers are esterase inhibitors, preferably trialkyl citrates, such as trimethyl citrate, tripropyl citrate, triisopropyl citrate, tributyl citrate and, in particular, triethyl citrate (Hydagen® CAT, Henkel KGaA, Düsseldorf, FRG). Esterase inhibitors inhibit enzyme activity and thus reduce odor formation. The free acid is probably released through the cleavage of the citric acid ester, reducing the pH value of the skin to such an extent that the

enzymes are inhibited. Other esterase inhibitors are sterol sulfates or phosphates, for example lanosterol, cholesterol, campesterol, stigmasterol and sitosterol sulfate or phosphate, dicarboxylic acids and esters thereof, for example glutaric acid, glutaric acid monoethyl ester, glutaric acid diethyl ester, 5 adipic acid, adipic acid monoethyl ester, adipic acid diethyl ester, malonic acid and malonic acid diethyl ester, hydroxycarboxylic acids and esters thereof, for example citric acid, malic acid, tartaric acid or tartaric acid diethyl ester. Antibacterial agents which influence the germ flora and destroy or inhibit the growth of perspiration-decomposing bacteria, may also be present in stick 10 products. Examples of such antibacterial agents are chitosan, phenoxy-ethanol and chlorhexidine gluconate. 5-Chloro-2-(2,4-dichlorophenoxy)-phenol, which is marketed under the name of Irgasan® by Ciba-Geigy of Basel, Switzerland, has also proved to be particularly effective.

UV protection factors in the context of the invention are, for example, 15 organic substances (light filters) which are liquid or crystalline at room temperature and which are capable of absorbing ultraviolet radiation and of releasing the energy absorbed in the form of longer-wave radiation, for example heat. UV-B filters can be oil-soluble or water-soluble. The following are examples of oil-soluble substances:

20

- 3-benzylidene camphor or 3-benzylidene norcamphor and derivatives thereof, for example 3-(4-methylbenzylidene)-camphor as described in **EP-B1 0693471**;
- 4-aminobenzoic acid derivatives, preferably 4-(dimethylamino)-benzoic 25 acid-2-ethylhexyl ester, 4-(dimethylamino)-benzoic acid-2-octyl ester and 4-(dimethylamino)-benzoic acid amyl ester;
- esters of cinnamic acid, preferably 4-methoxycinnamic acid-2-ethylhexyl ester, 4-methoxycinnamic acid propyl ester, 4-methoxycinnamic acid

- isoamyl ester, 2-cyano-3,3-phenylcinnamic acid-2-ethylhexyl ester (Octocrylene);
- esters of salicylic acid, preferably salicylic acid-2-ethylhexyl ester, salicylic acid-4-isopropylbenzyl ester, salicylic acid homomenthyl ester;
- 5 ● derivatives of benzophenone, preferably 2-hydroxy-4-methoxybenzophenone, 2-hydroxy-4-methoxy-4'-methylbenzophenone, 2,2'-dihydroxy-4-methoxybenzophenone;
- esters of benzalmalonic acid, preferably 4-methoxybenzalmalonic acid di-2-ethylhexyl ester;
- 10 ● triazine derivatives such as, for example, 2,4,6-trianilino-(p-carbo-2'-ethyl-1'-hexyloxy)-1,3,5-triazine and Octyl Triazone as described in **EP-A1 0818450**;
- propane-1,3-diones such as, for example, 1-(4-tert.butylphenyl)-3-(4'-methoxyphenyl)-propane-1,3-dione;
- 15 ● ketotricyclo(5.2.1.0)decane derivatives as described in **EP-B1 0694521**.

Suitable water-soluble substances are

- 2-phenylbenzimidazole-5-sulfonic acid and alkali metal, alkaline earth metal, ammonium, alkylammonium, alkanolammonium and glucammonium salts thereof;
- 20 ● sulfonic acid derivatives of benzophenones, preferably 2-hydroxy-4-methoxybenzophenone-5-sulfonic acid and salts thereof;
- sulfonic acid derivatives of 3-benzylidene camphor such as, for example,
- 25 4-(2-oxo-3-bornylidenemethyl)-benzene sulfonic acid and 2-methyl-5-(2-oxo-3-bornylidene)-sulfonic acid and salts thereof.

Typical UV-A filters are, in particular, derivatives of benzoyl methane

such as, for example, 1-(4'-tert.butylphenyl)-3-(4'-methoxyphenyl)-propane-1,3-dione, 4-tert.butyl-4'-methoxydibenzoyl methane (Parsol 1789) or 1-phenyl-3-(4'-isopropylphenyl)-propane-1,3-dione. The UV-A and UV-B filters may of course also be used in the form of mixtures. Besides the soluble substances mentioned, insoluble light-blocking pigments, i.e. finely dispersed metal oxides or salts, may also be used for this purpose. Examples of suitable metal oxides are, in particular, zinc oxide and titanium dioxide and also oxides of iron, zirconium oxide, silicon, manganese, aluminium and cerium and mixtures thereof. Silicates (talcum), barium sulfate and zinc stearate may be used as salts. The oxides and salts are used in the form of the pigments for skin-care and skin-protecting emulsions and decorative cosmetics. The particles should have a mean diameter of less than 100 nm, preferably between 5 and 50 nm and more preferably between 15 and 30 nm. They may be spherical in shape although ellipsoidal particles or other non-spherical particles may also be used. The pigments may also be surface-treated, i.e. hydrophilized or hydrophobicized. Typical examples are coated titanium dioxides, for example Titandioxid T 805 (Degussa) and Eusolex® T2000 (Merck). Suitable hydrophobic coating materials are, above all, silicones and, among these, especially trialkoxyoctylsilanes or simethicones. So-called micro- or nanopigments are preferably used in sun protection products. Micronized zinc oxide is preferably used. Other suitable UV filters can be found in P. Finkel's review in **SOFW-Journal 122, 543 (1996)**.

Besides the two groups of primary sun protection factors mentioned above, secondary sun protection factors of the **antioxidant** type may also be used. Secondary sun protection factors of the antioxidant type interrupt the photochemical reaction chain which is initiated when UV rays penetrate into the skin. Typical examples are amino acids (for example glycine, histidine, tyrosine, tryptophane) and derivatives thereof, imidazoles (for example

urocanic acid) and derivatives thereof, peptides, such as D,L-carnosine, D-carnosine, L-carnosine and derivatives thereof (for example anserine), carotinoids, carotenes (for example α -carotene, β -carotene, lycopene) and derivatives thereof, chlorogenic acid and derivatives thereof, liponic acid and derivatives thereof (for example dihydroliponic acid), aurothioglucose, propylthiouracil and other thiols (for example thioredoxine, glutathione, cysteine, cystine, cystamine and glycosyl, N-acetyl, methyl, ethyl, propyl, amyl, butyl and lauryl, palmitoyl, oleyl, γ -linoleyl, cholesteryl and glyceryl esters thereof) and their salts, dilaurylthiodipropionate, distearylthiodipropionate, thiodipropionic acid and derivatives thereof (esters, ethers, peptides, lipids, nucleotides, nucleosides and salts) and sulfoximine compounds (for example butionine sulfoximines, homocysteine sulfoximine, butionine sulfones, penta-, hexa- and hepta-thionine sulfoximine) in very small compatible dosages (for example pmole to μ mole/kg), also (metal) chelators (for example α -hydroxyfatty acids, palmitic acid, phytic acid, lactoferrine), α -hydroxy acids (for example citric acid, lactic acid, malic acid), humic acid, bile acid, bile extracts, bilirubin, biliverdin, EDTA, EGTA and derivatives thereof, unsaturated fatty acids and derivatives thereof (for example γ -linolenic acid, linoleic acid, oleic acid), folic acid and derivatives thereof, ubiquinone and ubiquinol and derivatives thereof, vitamin C and derivatives thereof (for example ascorbyl palmitate, Mg ascorbyl phosphate, ascorbyl acetate), tocopherols and derivatives (for example vitamin E acetate), vitamin A and derivatives (vitamin A palmitate) and coniferyl benzoate of benzoin resin, rutinic acid and derivatives thereof, α -glycosyl rutin, ferulic acid, furfurylidene glucitol, carnosine, butyl hydroxytoluene, butyl hydroxyanisole, nordihydroguaiac resin acid, nordihydroguaiaretic acid, trihydroxybutyrophenone, uric acid and derivatives thereof, mannose and derivatives thereof, Superoxid-Dismutase, zinc and derivatives thereof (for example ZnO, ZnSO₄), selenium

and derivatives thereof (for example selenium methionine), stilbenes and derivatives thereof (for example stilbene oxide, trans-stilbene oxide) and derivatives of these active substances suitable for the purposes of the invention (salts, esters, ethers, sugars, nucleotides, nucleosides, peptides and lipids).

In addition, **hydrotropes**, for example ethanol, isopropyl alcohol or polyols, may be used to improve flow behavior. Suitable polyols preferably contain 2 to 15 carbon atoms and at least two hydroxyl groups. The polyols may contain other functional groups, more especially amino groups, or may be modified with nitrogen. Typical examples are

- glycerol;
- alkylene glycols such as, for example, ethylene glycol, diethylene glycol, propylene glycol, butylene glycol, hexylene glycol and polyethylene glycols with an average molecular weight of 100 to 1000 dalton;
- technical oligoglycerol mixtures with a degree of self-condensation of 1.5 to 10 such as, for example, technical diglycerol mixtures with a diglycerol content of 40 to 50% by weight;
- methylol compounds such as, in particular, trimethylol ethane, trimethylol propane, trimethylol butane, pentaerythritol and dipentaerythritol;
- lower alkyl glucosides, particularly those containing 1 to 8 carbon atoms in the alkyl group, for example methyl and butyl glucoside;
- sugar alcohols containing 5 to 12 carbon atoms, for example sorbitol or mannitol,
- sugars containing 5 to 12 carbon atoms, for example glucose or sucrose;
- aminosugars, for example glucamine;
- dialcoholamines, such as diethanolamine or 2-aminopropane-1,3-diol.

Suitable **preservatives** are, for example, phenoxyethanol, formaldehyde solution, parabens, pentanediol or sorbic acid and the other classes of compounds listed in Appendix 6, Parts A and B of the Kosmetikverordnung ("Cosmetics Directive"). Suitable **insect repellents** are

5 N,N-diethyl-m-toluamide, pentane-1,2-diol or Insect Repellent 3535. A suitable **self-tanning agent** is dihydroxyacetone.

Suitable **perfume oils** are mixtures of natural and synthetic fragrances. Natural fragrances include the extracts of blossoms (lily, lavender, rose, jasmine, neroli, ylang-ylang), stems and leaves (geranium,

10 patchouli, petitgrain), fruits (anise, coriander, caraway, juniper), fruit peel (bergamot, lemon, orange), roots (nutmeg, angelica, celery, cardamon, costus, iris, calmus), woods (pinewood, sandalwood, guaiac wood, cedarwood, rosewood), herbs and grasses (tarragon, lemon grass, sage, thyme), needles and branches (spruce, fir, pine, dwarf pine), resins and

15 balsams (galbanum, elemi, benzoin, myrrh, olibanum, opoponax). Animal raw materials, for example civet and beaver, may also be used. Typical synthetic perfume compounds are products of the ester, ether, aldehyde, ketone, alcohol and hydrocarbon type. Examples of perfume compounds of the ester type are benzyl acetate, phenoxyethyl isobutyrate, p-tert.butyl

20 cyclohexylacetate, linalyl acetate, dimethyl benzyl carbonyl acetate, phenyl ethyl acetate, linalyl benzoate, benzyl formate, ethylmethyl phenyl glycinate, allyl cyclohexyl propionate, styrallyl propionate and benzyl salicylate. Ethers include, for example, benzyl ethyl ether while aldehydes include, for example, the linear alkanals containing 8 to 18 carbon atoms, citral, citronellal,

25 citronellyloxyacetaldehyde, cyclamen aldehyde, hydroxycitronellal, linal and bourgeonal. Examples of suitable ketones are the ionones, α -isomethylionone and methyl cedryl ketone. Suitable alcohols are anethol, citronellol, eugenol, isoeugenol, geraniol, linalool, phenylethyl alcohol and

terpineol. The hydrocarbons mainly include the terpenes and balsams. However, it is preferred to use mixtures of different perfume compounds which, together, produce an agreeable fragrance. Other suitable perfume oils are essential oils of relatively low volatility which are mostly used as aroma components. Examples are sage oil, camomile oil, clove oil, melissa oil, mint oil, cinnamon leaf oil, lime-blossom oil, juniper berry oil, vetiver oil, olibanum oil, galbanum oil, labolanum oil and lavendin oil. The following are preferably used either individually or in the form of mixtures: bergamot oil, dihydromyrcenol, lillial, lyral, citronellol, phenylethyl alcohol, α -hexylcinnamaldehyde, geraniol, benzyl acetone, cyclamen aldehyde, linalool, Boisambrene Forte, Ambroxan, indole, hedione, sandelice, citrus oil, mandarin oil, orange oil, allylamyl glycolate, cyclovertal, lavendin oil, clary oil, β -damascone, geranium oil bourbon, cyclohexyl salicylate, Vertofix Coeur, Iso-E-Super, Fixolide NP, evernyl, iraldein gamma, phenylacetic acid, geranyl acetate, benzyl acetate, rose oxide, romillat, irotyl and floramat.

Suitable **dyes** are any of the substances suitable and approved for cosmetic purposes as listed, for example, in the publication "**Kosmetische Färbemittel**" of the **Farbstoffkommission der Deutschen Forschungsgemeinschaft, Verlag Chemie, Weinheim, 1984, pages 81 to 106**. These dyes are normally used in concentrations of 0.001 to 0.1% by weight, based on the mixture as a whole.

Typical examples of **germ inhibitors** are preservatives which act specifically against gram-positive bacteria such as, for example, 2,4,4'-trichloro-2'-hydroxydiphenyl ether, chlorhexidine (1,6-di-(4-chlorophenyl)-biguanido)-hexane) or TCC (3,4,4'-trichlorocarbanilide). Numerous perfumes and essential oils also have antimicrobial properties. Typical examples are the active substances eugenol, menthol and thymol in nettle, mint and thyme oil. An interesting natural deodorant is the terpene alcohol farnesol (3,7,11-

trimethyl-2,6,10-dodecatrien-1-ol) which is present in linden blossom oil and which smells of lily-of-the-valley. Glycerol monolaurate has also been successfully used as a bacteriostatic agent. The percentage content of the additional germ inhibitors is normally about 0.1 to 2% by weight, based on the solids component of the formulations.

The total percentage content of auxiliaries and additives may be from 1 to 50% by weight and is preferably from 5 to 40% by weight, based on the particular composition. The compositions may be produced by standard hot or cold processes and are preferably produced by the phase inversion temperature method.

Treatment of the tissue papers with the softening compositions

The treatment of the tissue papers with the softening compositions may be carried out in known manner, the solution being applied to at least one side of the papers. Basically, any known method by which liquids or melts can be applied to more or less hard surfaces may be used for this purpose, including for example spraying, printing (for example flexographic printing), coating (gravure coating), extrusion and combinations of these methods. The papers/tissues may also be impregnated with the compositions. Application of the compositions is generally followed by a brief drying step. Processes for treating tissue papers with softening compositions are described in detail in the above-cited documents WO 95/35411 and WO 97/30216 to which reference is hereby specifically made.

Examples

To test performance properties, commercially available three-ply tissue papers with a recycled paper content of 95% and a weight of 18 g/m² were

treated with emulsions 1 to 5 according to the invention and with the two comparison compositions C1 and C2 in quantities of 2.5 g/m². The papers were then dried for 30 minutes at 30°C, after which their softness was evaluated by a panel of six experienced testers on a scale of (+++) very soft to (+) hard. The sensorial feeling on touching the tissues was also evaluated. The results which represent the averages of three test series are set out in Table 1.

Table 1

Softness of tissue papers using emulsions

[illegible]

CLAIMS

1. The use of emulsions containing

- (a) polyol poly-12-hydroxystearates,
- (b) wax esters and
- (c) waxes

as impregnating and softening compositions for papers, nonwovens and cloths.

2. The use of emulsions as claimed in claim 1, characterized in that polyglycerol poly-12-hydroxystearates are used as component (a).

3. The use of emulsions as claimed in claims 1 and/or 2, characterized in that wax esters corresponding to formula (I):



(I)

in which R^1CO is a linear or branched acyl group containing 6 to 22 carbon atoms and 0 and/or 1 to 3 double bonds and R^2 is a linear or branched alkyl and/or alkenyl group containing 6 to 22 carbon atoms, with the proviso that the number of carbon atoms in the ester is at least 20.

4. The use of emulsions as claimed in at least one of claims 1 to 3, characterized in that waxes selected from the group consisting of candelilla wax, carnauba wax, Japan wax, espartograss wax, cork wax, guaruma wax, rice oil wax, sugar cane wax, ouricury wax, montan wax, beeswax, shellac wax, spermaceti, lanolin (wool wax), uropygial fat, ceresine, ozocerite (earth wax), petrolatum, paraffin waxes, microwaxes; chemically modified waxes (hard waxes) such as, for example, montan ester waxes, sasol waxes, hydrogenated jojoba waxes and synthetic waxes such as, for example,

polyalkylene waxes and polyethylene glycol waxes are used as component (c).

5. The use claimed in at least one of claims 1 to 4, characterized in that emulsions containing - based on active substance -

- (a) 5 to 25% by weight of polyol poly-12-hydroxystearates,
- (b) 50 to 90% by weight of wax esters and
- (c) 5 to 25% by weight of waxes,

with the proviso that the quantities shown add up to 100% by weight, are used.

6. The use claimed in at least one of claims 1 to 6, characterized in that emulsions with an active substance content of 0.5 to 80% by weight are used.

7. The use claimed in at least one of claims 1 to 6, characterized in that emulsions containing skin-care oils as auxiliaries and additives are used.

8. The use claimed in at least one of claims 1 to 7, characterized in that emulsions additionally containing nonionic, amphoteric and/or cationic co-emulsifiers are used.

9. The use claimed in at least one of claims 1 to 8, characterized in that emulsions containing active substances as auxiliaries and additives are used.

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Attorney Docket
Number

H 3954 PCT/US

First Named
Inventor

Baumoeller, Guido

COMPLETE IF KNOWN

Application Number

09/913,378

Filing Date

11/02/01

Group Art Unit

Examiner Name

As a below named inventor, I hereby declare that

My residence, post office address, and citizenship are as stated below next to my name

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

USE OF EMULSIONS AS IMPREGNATING AGENTS AND REVIVING AGENTS

(Title of the Invention)

the specification of which

☐

is attached hereto

OR

☒

was filed on (MM/DD/YYYY)

02/04/2000

as United States Application Number or PCT International

Application Number

PCT/EP00/00904

and was amended on (MM/DD/YYYY)

(if applicable).

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment specifically referred to above

I acknowledge the duty to disclose information which is material to patentability as defined in Title 37 Code of Federal Regulations, § 1.56.

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Prior Foreign Application Number(s)	Country	Foreign Filing Date (MM/DD/YYYY)	Priority		Certified Copy Attached?	
			Not Claimed		YES	NO
199 06 081.9	Germany	02/13/1999	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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DECLARATION**Page 2**

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U.S. Parent Application Number	PCT Parent Number	Parent Filing Date (MM/DD/YYYY)	Parent Patent Number (if applicable)
	PCT/EP00/00904	02/04/2000	

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As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith.

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☒ List Attorney(s) and/or agent(s) name and registration number below.

Name	Registration Number	Name	Registration Number
John E. Drach	32,891	Steven J. Trzaska	36,296
Aaron E. Ettelman	42,516	Henry E. Millson, Jr.	18,980

☐ Additional attorney(s) and/or agent(s) named on a supplemental sheet attached hereto

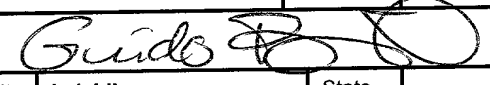
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Name	Steven J. Trzaska		
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Address			
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Country	Telephone	610-278-4929	Fax 610-278-6548

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Name of Sole or First Inventor: ☐ A petition has been filed for this unsigned inventor /

Given Name	Guido	Middle Initial		Family Name	BAUMOELLER	Suffix e.g. Jr.	
------------	-------	----------------	--	-------------	------------	-----------------	--

Inventor's Signature		Date	Aug. 22, 2001
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Residence: City	Leichlingen	State		Country	Germany	Citizenship	Germany
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Post Office Address	Am Treppchen 5
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Post Office Address	
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City	42799 Leichlingen	State		Zip		Country	Germany	Applicant Authority	
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☒ Additional inventors are being named on supplemental sheet(s) attached hereto

Type a plus sign (+) inside this box → ☐

H 3954 PCT/US

DECLARATION

ADDITIONAL INVENTOR(S)
Supplemental Sheet

Name of Additional Joint Inventor, if any:

☐ A petition has been filed for this unsigned inventor

Given Name

Rolf

Middle Initial

Family Name

KAWA

Suffix e.g. Jr.

Inventor's Signature

Date

Aug. 22, 2001

Residence: City

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Citizenship

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Name of Additional Joint Inventor, if any:

☐ A petition has been filed for this unsigned inventor

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Inventor's Signature

Date

Aug. 22, 2001

Residence: City

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Applicant Authority

Name of Additional Joint Inventor, if any:

☐ A petition has been filed for this unsigned inventor

Given Name

Middle Initial

Family Name

Suffix e.g. Jr.

Inventor's Signature

Date

Residence: City

State

Country

Citizenship

Post Office Address

Post Office Address

City

State

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Name of Additional Joint Inventor, if any:

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Date

Residence: City

State

Country

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State

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Country

Applicant Authority

☐ Additional inventors are being named on supplemental sheet(s) attached hereto